Open-source DevOps DiveIn

Linux, Ansible and OpenTofu

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$ whoami

- I am certified Red Hat Certified engineer for Linux and Ansible
- Community Evangelist - Building communities one step at a time
- Working as a Associate Product Specialist at Corestack and part time
- Leading DevOps Chennai and MUG Chennai
- Teaching K12 kids essence of Computer Science
- Anime fan - currently watching My Hero Academia S7

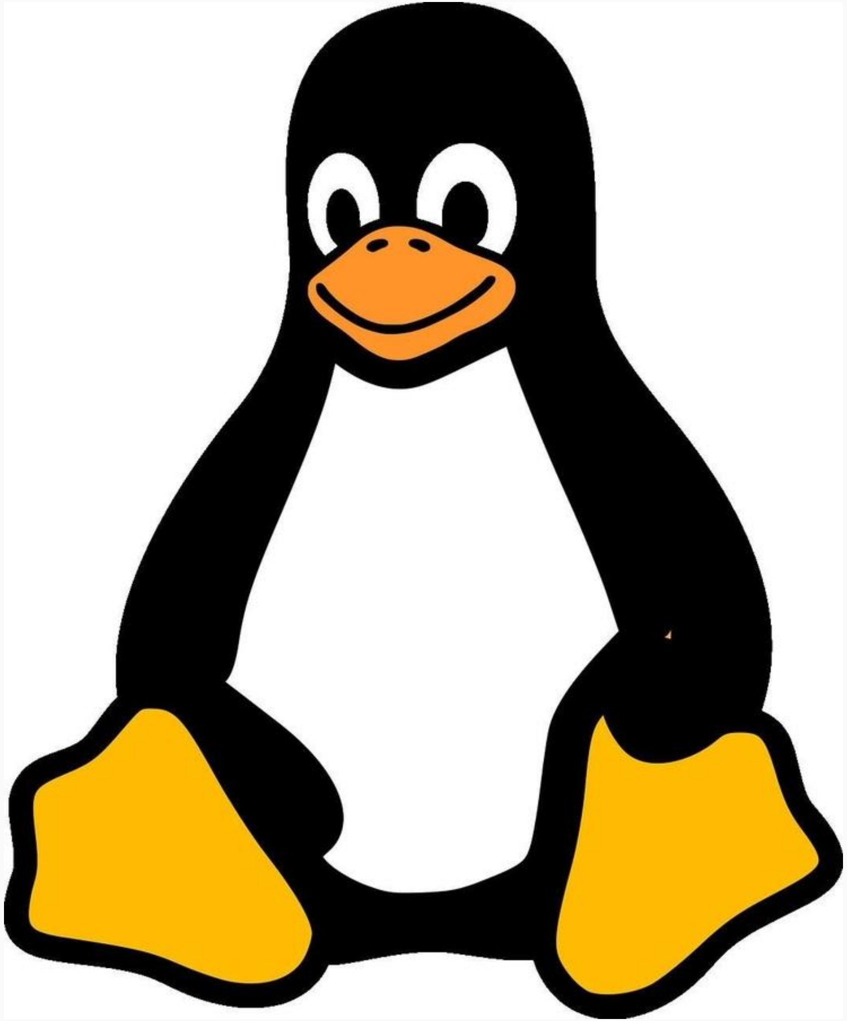
$ echo “Agenda For the Session”

- Linux - Introduction, Fundamentals and Demo
- Ansible - Introduction, FundaMentals and Demo
- OpenTofu - Introduction, Fundamentals and Demo
- QNA

Linux

Linux is an open-source, Unix-like operating system (OS) based on the Linux kernel, which was originally developed by Linus Torvalds in 1991. It is known for its stability, security, and flexibility, making it popular in a wide range of environments from servers and desktops to mobile devices and embedded systems.

We will be Using the Ubuntu for today as it's my goto OS when it comes to linux.



Linux Demo

Let dive in straight

Command Line:Basics and Demo

#date → print current date and time

#cal → Shows calendar

#cd → command to go inside a folder

#echo → To print any screen

Command Line:Basics and Demo

#ls → list the dir

#mkdir → make a folder

#apt → command to install any program

#vim → magical CLI text editing tool

Command Line:Basics and Demo

#export → create bash variables

#ifconfig → Shows IP configuration

#gedit → command to open GUI text editor

And more.

How to Install a package - manual way

Ubuntu - $ sudo apt install apache2

Centos - $ sudo dnf installed httpd

What if we have 100 Servers with 20 different flavours of the Linux?

Ansible

Is the way to go

ANSIBLE

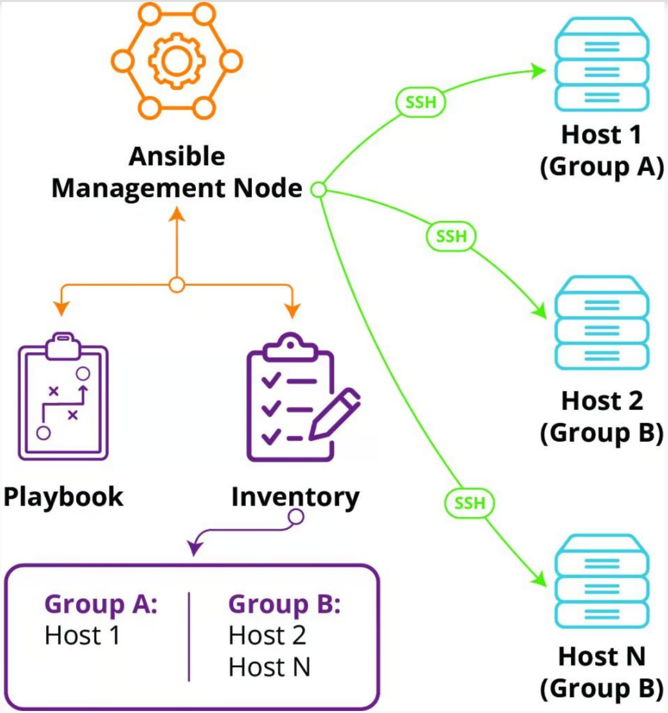
What is Ansible?

Ansible is an open source IT automation engine that automates provisioning, configuration management, application deployment, orchestration, and many other IT processes. It is free to use, and the project benefits from the experience and intelligence of its thousands of contributors.

How Ansible Works?

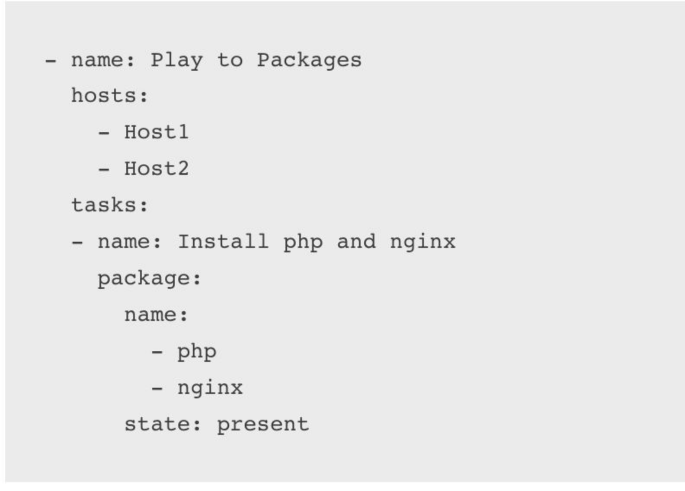
Ansible works by connecting to the programs, and you want to automate and push scripts that carry out instructions that would have been handled directly. These programs use Ansible components that are created based on the endpoint's connectivity, user interface, and commands.

Ansible executes modules over standard Secure Socket Shell (SSH) by default and, if applicable, removes them when done. There is no need for extra servers, daemons, or databases, and users can use a terminal application, text editor, and version control system to keep track of changes.



What we need to do?

- Install Ansible
- Open Up SSH port
- Configure Inventory
- Configure Playbook



```
- name: Play to Packages
  hosts:
    - Host1
    - Host2
  tasks:
  - name: Install php and nginx
    package:
      name:
        - php
        - nginx
      state: present
```

What is Ansible Playbook?

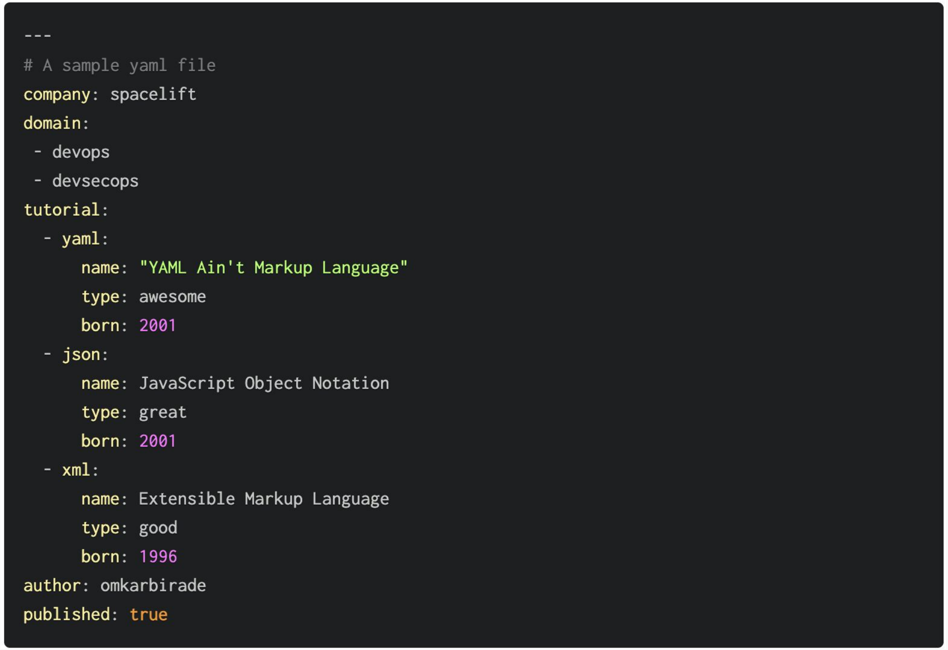
A set of complicated IT tasks that can be automated and carried out with little to no human involvement is called an Ansible Playbook. The hosts that make up an Ansible inventory are subjected to the Ansible Playbooks that are executed on them.

Playbooks are Ansible code files written in YAML format. Ansible Playbooks provide a repeatable, reusable, simple configuration management and multi-machine deployment solution ideal for deploying complex applications. The playbook can then be used to send new configurations or confirm the configuration of remote systems.

Example of Ansible Playbook: Once you execute the playbook, it will install the PHP and Nginx on the Host1 and Host2 servers.

Ansible Pre-Requisite YAML(YET Another Markup Language)

YET Another Markup Language



```yaml
---
# A sample yaml file
company: spacelift
domain:
 - devops
 - devsecops
tutorial:
  - yaml:
      name: "YAML Ain't Markup Language"
      type: awesome
      born: 2001
  - json:
      name: JavaScript Object Notation
      type: great
      born: 2001
  - xml:
      name: Extensible Markup Language
      type: good
      born: 1996
author: omkarbirade
published: true
```

Ready to write Ansible Playbooks? :)

Ansible Demo

Let dive in straight

OpenTofu

Earlier last year Hashicorp the Owner of Terraform made Terraform under Business Use Licence, Sparking the formation of OpenTOFU that is now adopted by all the Cloud enterprise organizations.

What is OpenTofu?

- OpenTofu is a fully open-source fork of Terraform.
- OpenTofu will be managed under a Linux foundation similar to how Linux is managed with the help of multiple companies and contributors. OpenTofu was announced at Open Source Summit Europe 2023 and on 14th August 2023 published an OpenTofu manifesto followed by officially launching as a Linux Foundation project on 20th August 2023.
- OpenTofu has crossed over 15K public stars on GitHub and is being supported by multiple organisations.
- Some organisations have even pledged software engineers over a period of time to work on OpenTofu and contribute to its engineering.

OpenTofu in Action

OpenTofu is an infrastructure as code tool that lets you define both cloud and on-prem resources in human-readable configuration files that you can version, reuse, and share. You can then use a consistent workflow to provision and manage all of your infrastructure throughout its lifecycle. OpenTofu can manage low-level components like compute, storage, and networking resources, as well as high-level components like DNS entries and SaaS features.

How does OpenTofu work?

- OpenTofu creates and manages resources on cloud platforms and other services through their application programming interfaces (APIs). Providers enable OpenTofu to work with virtually any platform or service with an accessible API.
- OpenTofu creates and manages cloud platforms and services through their APIs.
- The OpenTofu community have already written thousands of providers to manage many different types of resources and services. You can find all publicly available providers on the Public OpenTofu Registry, including Amazon Web Services (AWS), Azure, Google Cloud Platform (GCP), Kubernetes, Helm, GitHub, Splunk, DataDog, and many more.

The core OpenTofu workflow consists of three stages:

Write: You define resources, which may be across multiple cloud providers and services. For example, you might create a configuration to deploy an application on virtual machines in a Virtual Private Cloud (VPC) network with security groups and a load balancer.

Plan: OpenTofu creates an execution plan describing the infrastructure it will create, update, or destroy based on the existing infrastructure and your configuration.

Apply: On approval, OpenTofu performs the proposed operations in the correct order, respecting any resource dependencies. For example, if you update the properties of a VPC and change the number of virtual machines in that VPC, OpenTofu will recreate the VPC before scaling the virtual machines.

OpenTofu Demo

Let dive in straight

Thanks You for Attending.

Reach Out to me if You have any questions.

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